| | General Topic | Research Question | Notes | Proposed by | Existing Literature | Comments | Response by |
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| 1 | Design of Diversion Berms | What is typical (and maximum) flow depth (or thickness) in unconfined condition on a fan? How sensitive is this flow depth to the debris flow frequency-magnitude relationship? Can flow depth be correlated with debris flow type, watershed area, fan area, or other parameters that can be easily estimated or measured? | Flow depth is typically estimated based on fan exposures, modeling, or related to channel depth. | Alex Strouth | | | |
| 2 | Design of Diversion Berms | What is debris flow runup height on berms oriented oblique to flow direction? What are typical consequences of runup on top of or over a berm? | Runup is typically estimated by velocity vector component perpendicular to berm. | Alex Strouth | Iverson 2016 | From the field feedback we have in France:<br>-after debris flows events , several cases of runup over dykes or berms were reported, without any failure of the structure (only deposit).<br>-on the contrary failures were reported after overtopping of debris floods or bedload-laden flows, as could be expected for any earth dam.<br>We are performing a full assessment of open check dam failures and adaptations in France: new elements could emerge in 2018. | Guillaume PITON |
| 3 | Design of Conveyance Channels | What is the relationship between channel confinement, slope angle, and conveyance or deposition? | Conveyance channels on fans are typically inclined near the threshold between conveyance and deposition. | Alex Strouth | Hungr 1984 | | |
| | | | | | Busslinger 2010 | See figures 3.9 and 3.10 for some empirical relationships for data from Queen Charlotte Islands, BC (now Haida Gwaii) and Kootenay Region, BC. | Matthias Busslinger |
| 4 | Design of Barriers | How fast does captured debris drain (for different conditions)? Is hydrostatic condition (K=1.0) true for debris flood events, which fill barriers gradually? | Static conditions tend to control design of debris flood barriers | Alex Strouth | Wendeler? GEO Report 270, 2012<br><br>Rudolf-Miklau & Suda | For elements on load cases depending on the process according to Austrian standards | Guillaume PITON |
| 5 | Debris flow hazard assessment | Why do some debris flow events scour and entrain large volumes of material on the fan? Where is this likely to happen? | | Alex Strouth | Harvey 2012 | In my experience, debris flow events rather tend to deposit on fans (at least those of resoneable gradient). On the contrary debris floods may generate dramatic scouring. Harvey gives first insight on various types of fan behaviors that strongly depend on coupling with both the downstream river and the upstream creek.<br>Further works are certainly neeeded to locate scouring prone areas: we have some idea on this but lack data on pre and post flood topography and elements on the event (hydrograph, etc.). | Guillaume PITON |
| 6 | Debris flow risk assessment | Debris flow vulnerability: What is the likelihood of building damage and loss of life for different environments, construction types, activities? | Data collections following debris flow events is needed | Alex Strouth | Jakob 2011 | | |
| 7 | Frequency magnitude | What are best practices for estimating the return period of a given debris flow event? What are the limits on the transfer of FM relationships within and between regions? | | Chris Bunce | Jakob and others | | |
| 8 | Regulatory or design requirements | What return period design event is required for different jurisdictions and owners? | Discussed on the call | Chris Bunce and others | Rudolf-Miklau & Suda | The design event should fundamentally be adapted to the element at risk: a mountain path seldom used deserve a less conservative design than a crowded city. Some kind of standards may be used in some country but they should be flexible. Ultimately a sort of cost-benefit analysis should determine the relevant return period to select; See also Piton & Recking 2016 for just a comment on it. | Guillaume PITON |
| 9 | Design of Barriers | How can the number of individual surges of a debris flow event arriving at a barrier location be objectively (or at least empirically) estimated? E.g. is there a relationship between sediment concentration (or solids content) and the number of surges? | Design loads are sensitive to the assumption of the number of surges arriving at a barrier location, yet there is little objective guidance to make this estimate. | Matthias Busslinger | | | |